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REMARKS

1. Applicant thanks the Examiner for the Examiner's comments which have greatly assisted Applicant in responding.

2. It should be appreciated that Applicant has elected to amend Claims 1, 31-39, 42, and 45 solely for the purpose of expediting the patent application process in a manner consistent with the PTO's Patent Business Goals, 65 Fed. Reg. 54603 (9/8/00). In making such amendment, Applicant has not and does not in any way narrow the scope of protection to which Applicant considers the invention herein to be entitled. Rather, Applicant reserves Applicant's right to pursue such protection at a later point in time and merely seeks to pursue protection for the subject matter presented in this submission.

3. 35 U.S.C. §102(b).

The Examiner has rejected Claims 1-46 under 35 U.S.C. §102(b) as being anticipated by Prezioso (U.S. Patent No. 5,577,169).

Applicant respectfully disagrees, however, Applicant has amended each of the independent claims to further clarify the distinction of the claimed invention over the prior art of record. Specifically, the prior art of record does not teach nor suggestion a multiple entity defined comprising interacting pairs of entities, as discussed further hereinbelow. Applicant submits that no new matter is added and that the amendment is supported by the disclosure. All other claims remain the same.

Support can further be found in the Abstract provided herein below, emphasis added:

Computer implemented processes and software products generate profiles of entities, such as providers, clients, merchants and customers, **and entities comprising interacting pairs of entities**. The processes including deriving direct profiles from transaction data pertaining to an entity **and enhancing the profile of one entity using the profile of another entity**. Parallel and serial applications of the derive and enhance processes on various individual **and multiple entities yields enhanced profiles that powerfully describe the interactions and relationship of the entities to each other, and between their members**.

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Applicant respectfully points out that Prezioso (US 5,577,169) does not teach entities comprising interacting pairs of entities. Additionally, as in previous responses, Applicant is still of the opinion that Prezioso (US 5,577,169) does not teach enhancing the profile of one entity using the profile of another entity, nor enhance processes, nor multiple entities yielding enhanced profiles that powerfully describe the interactions and relationship of the entities to each other, and between their members, to which the claimed invention is primarily directed.

- 10 Support for demonstrating how the invention is distinguished from the prior art of record, Prezioso, follows (emphasis added).

(1: 35-43)

- 15 While these systems have achieved some level of success, there still remains large classes of problems that are yet unsolved. One such class of problems is the assessment of behavior in determining meaningful profiles of entities **relative to others within the same general peer group**. Attempts at conducting computerized behavior profiling have been made, particularly in the health care industry, with little success.

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The above does not teach interacting pairs of entities as an entity nor multiple entities.

(3:52-61)

- 25 First, behavior characteristics, or indicators of a target behavior, are determined. Norms and fuzzy sets are established for each behavior characteristic and then fuzzy logic is used to develop a series of scores. **A behavior profile is developed from a collection of scores, and is organized either linearly or in a hierarchy, that can be used to compare the degree to which an entity within a peer group is, or is not, associated with a set of behavior characteristics relative to others in the same peer group.**
- 30

The above demonstrates the main teachings of the prior art of record and in doing so illustrates that the prior art of record **does not teach** features of the claimed invention.

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Columns 5-6 do not teach an interaction between profiles, nor then, could it teach an entity (profile thereof) which is itself the interaction of two separate entities (profiles thereof).

5 (6:51-56)

In general, peer groups can be defined 310 in any domain, or field of activity, for which data exists to support the quantifying of the behavior characteristics comprising the behavior profile. Demographic similarity can be established in a number of ways or may not be a necessary element in the peer group definition.

10

Nowhere does the prior art of record teach members of peer groups interaction with other members outside the peer group, and hence, have an entity/profile be comprised of interacting entities /profiles or multiple entities/profiles. Prezioso's teachings are confined to within a specific peer group.

15

(7:9-20)

Once the homogeneous collection of entities is identified 310, a peer group is further defined 210 by establishing that sufficient quantity and quality of data exists 320 in a form compatible with the System 100. A key element of the data used in profiling a peer group is that it be organized, or be organizable, according to the definition of the peer group and the data needed to quantify the behavior characteristics comprising the behavior profile is available for each entity in the peer group. As example refer to the data structures described in FIGS. 13 and 14 that for physicians and cashiers respectively.

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25

(7:59-65)

The specific data elements that need to be collected are the data elements required of the algorithms defined below (in the description of box 430 of FIG. 4) to quantify behavior characteristics. Examples of the data elements required to quantify behavior characteristics for physicians and cashiers are shown in FIGS. 13 and 14 respectively.

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(9:49-53)

Step 460 requires the system designer to define a data structure that includes all the data elements determined in box 440. A novel organization of this data in the

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present invention is shown by example in FIGS. 13 and 14 for physician profiling and cashier profiling respectively.

(9:63-10:3)

5 In step 490 a computer program is executed to perform the steps required of the behavior characteristic algorithms determined in step 430. **For each entity in a peer group, a value is derived for each behavior characteristic for the entity in**
10 accordance with the behavior characteristic algorithm and is stored using generally known methods on system component 120 in the data structure described in FIG. 25.

(13:64-14:2)

15 For example, in FIG. 18, **the degree of membership (0.51) 1880 of an entity (e.g. physician) in the behavior characteristic (e.g. Unusually High or Low Avg Patient Age), is determined by the degree to which the entity's (physician's) behavior characteristic value (26) 1870 is above or below the behavior characteristic statistical norm (40) 1890.**

20 Nowhere in the examples, nor the disclosure, are **interacting entities/profiles shown multiple entities/profiles, nor enhanced profiles, and across peer groups, such as for physician AND client, for example, as per the claimed invention.**

In stark contrast, the claimed invention is clearly distinguished from the prior art of record, as follows (emphasis added):

25 (On page 2, lines 3-9)

30 Thus, examples of entities in a healthcare setting are **clients, providers** (this includes doctors, hospitals, pharmacies, etc.), **clients' families, etc. and their interactions are captured** in the claims data; i.e. the interaction of a healthcare provider and a patient is captured in a claim by the provider for reimbursement. In the credit card world, the interacting entities are account holders, merchants, credit card issuers, and the like and their interactions are captured through different types of transactions such as purchases and payments.

35 (Summary)

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5 The present invention provides a refined and modular approach to deriving profiles from transactional data that enables an in-depth characterization of any target entity. The approach is based on profiling **not only the target entity itself, but also other entities that interact with the target entity via transactions.** This includes profiling the interacting pairs of entities themselves as entities. The profiles of different entities are merged and rolled-up in appropriate logical steps to produce a ~~sophisticated set of features describing the activity of the target entity.~~ Any desired profile variable (i.e., a behavioral feature based on the transactional data) for a given entity can be derived through this process. The result of this process is a cascaded
10 profile that describes **and summarizes the historical transaction patterns of multiple interacting entities, such as the transaction patterns of entity pairs** (e.g., the transaction pattern of a particular provider and client together). The cascaded profile provides summary level statistics that are not available merely by summarizing transactions across a single individual entity, **but only arise out of the**
15 **interactions of multiple entities.**

The present invention may be embodied as a software implemented process, executing on a conventional computer, or as a software product on a computer readable medium, which controls the operations of a computer and which includes
20 functional modules which provide the processes to **derive, rollup, merge, and enhance profiles, or as part of a computer system.** The present invention may be used in processes and systems to generate profiles for developing predictive statistical models of the transactional behavior of one or more entities, and in processes and systems to generate profiles for predicting or categorizing
25 transactional behavior of such entities.

The features and advantages described in this summary and the following detailed description are not all-inclusive, and particularly, many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings,
30 specification, and claims hereof. Moreover, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter, resort to the claims being necessary to determine such inventive subject matter.

35 (On page 7, lines 6-11)

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5 The above examples illustrate how the conversion of the raw transaction data into a comprehensive profile for each entity provides a powerful tool for performing different kinds of analyses and developing useful rules and predictive models. The following sections describe the process by which the transaction data for an application can be used to produce a summary of the target entity's activity that takes into account, not only the activity of the entity itself, but also the complete activities of all entities interacting with the target entity.

10 Table 3 on page 9, shows multiple transactions for many providers and multiple transactions for many of the clients.

Table 5 shows derived and enhanced data.

(On page 13, lines 27-31)

15 **Enhance Process** -- An additional type of process used in creating these cascaded processes is termed the enhance process. **The enhance process is a sequential combination of three processes** -- a merge process, the derive process, and the roll-up process, where the derive and roll-up processes are as described above and are optionally included as part of the enhance process. The merge process is described next.

20

(On page 14, lines 4-8)

25 Then, within a transaction, **the interacting pair of T and A (designated "T/A") can itself be considered an entity** and profile variables can be constructed for this pair as an entity using the same direct profiling process 103 that would be used for the individual entities T and A. **The profile dataset 202 for the interacting pair entity T/A is produced by the profiling process 103**

(On page 14, lines 13-17)

30 Then, given the two profile datasets 202, 204 **represented by T/A and A**, the merge process is the process of **combining the two datasets in the following manner, to produce an enhanced profile dataset T/A* 206**. The "*" designation indicates an enhanced profile dataset, and the dual arrows into an enhanced dataset indicate the enhance process 203.

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(On page 18, lines 20-24)

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For example, a variable that captures the percentage of a given provider's clients seeing other providers on the same day that the given provider is visited can be computed at this step and may reveal cases of "ping-ponging" (i.e., fraud schemes where nearby providers collude in fraudulent/abusive activity by performing unnecessary services on each other's clients).

(On page 22, lines 9-15)

The importance of the provider-client variables is that they enable the expansion of the provider or client profile. Thus if the provider is the target entity, the provider-client variables can first be merged with the client-based profile and then rolled-up to the provider level to obtain distributions of various activities characterizing the provider's client interactions. Similarly, if the client is the target entity, the same provider-client variables are first merged with the provider's profile and rolled-up to the client level to obtain distributions of various activities characterizing the client's interactions with different providers.

(On page 23, lines 15-21)

Client variables capture the combined activity of all providers that delivered services to the client. On the other hand, Client/Provider variables capture each specific provider's activity with the client. For example, assume Client-x received services from 5 different providers (Providers A-E). For any given feature or activity, we can compute variables for Client-x, and analogous variables for x-A (Client x, Provider A), x-B, x-C, x-D and x-E. Ratios, such as $x-A/x$ reveal a single provider's contribution to the overall activity involving the client.

The Examiner will therefore appreciate that Prezioso does not provide entities comprising interacting pairs of entities, enhanced profiles resulting from the process of enhancing the profile of one entity using the profile of another entity, multiple entities yielding enhanced profiles that powerfully describe the interactions and relationship of the entities to each other, and between their members, to which the claimed invention is primarily directed, and their corresponding processes. It is submitted that a person skilled in the art would not read such features as there is nothing to suggest such features as noted in the disclosure.

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Therefore, in view of the argument hereinabove, Applicant is of the opinion that Independent Claims 1, 31-39, 42, and 45, and the respective dependent claims, are in condition for allowance. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection under 35 U.S.C. §102(b).


5

CONCLUSION

Based on the foregoing, Applicant considers the present invention to be distinguished from the art of record. Accordingly, Applicant earnestly solicits the Examiner's withdrawal of the rejections raised in the above referenced Office Action, such that a Notice of Allowance is forwarded to Applicant, and the present application is therefore allowed to issue as a United States patent.

15

Respectfully Submitted,



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